REMARKS

Claims 1-18 are pending and await further action on the merits.

[I] Drawings

The Examiner is respectfully requested to acknowledge whether the drawings filed in the present application are acceptable.

[II] Prior art based issues

Claims 1-18 are rejected under 35 USC 103(a) as being unpatentable over Motomura et al (JP 2002-015743) in view of Mizuno (US 2001/0049047). Applicants respectfully traverse the rejection.

[II-A] Advantages of the Present Invention

Claims 1 and 10 of the present application are respectively directed to an electric power generating element for a fuel cell and a fuel cell using the same, and characterized in that at least one of a positive electrode and a negative electrode thereof has a laminate of at least two electrode layers containing a catalyst, and an adhesive layer is disposed between the electrode layers. In the invention of the present application, the adhesive layer is disposed between the electrode layers, thereby allowing easy formation of the laminate (see the first full paragraph of page 5 of the specification).

Also, claims 7 and 16 of the present application are respectively directed to an electric power generating element for a fuel cell and a fuel cell using the same, and characterized in that at least one of a positive electrode and a negative electrode thereof has a laminate of at least two electrode layers containing a catalyst and a polymer material having a proton conducting property, and the polymer material is present more in an interface part of each of the electrode layers than in an inner part thereof. In the invention of the present application, the polymer material with a proton conducting property is present more in an interface part of each electrode layer than in an inner part thereof, whereby the interface part functions as the adhesive layer, making it possible to integrate the individual electrode layers preferably to provide a laminate (see page 12, lines 26-31 of the present specification).

[II-B] Distinctions between the present invention and the teachings of Motomura et al. and Mizuno:

In contrast, although Motomura et al. disclose that a catalyst layer and a polymer electrolyte membrane are joined using an adhesive, Motomura et al. neither teach nor suggest:

(i) providing the adhesive layer between the catalyst layers that are laminated, as recited in present claims 1 and 10; or

(ii) making the polymer material having the proton conducting property present more in the interface part of each of the catalyst layers that are laminated than in the inner part thereof, as recited in present claims 7 and 16.

Furthermore, although Mizuno discloses that a gas sealing property is improved by bonding a solid polymer electrolyte film to a frame, Mizuno fails to teaches or suggests:

(iii) laminating the electrode layers, i.e., the catalyst layers, as recited in all independent claims 1, 7, 10 and 16; or

(iv) providing the adhesive layer between the electrode layers that are laminated; or

(v) making the polymer material having the proton conducting property present more in the interface part of each of the electrode layers than in the inner part thereof.

Furthermore, these features of the present claims result in a distinct structure having advantages not seen in the cited prior art as shown in Table 1 of the present specification (the most relevant portions of which are reproduced hereinbelow for the Examiner's convenience):

Table 1

	Thickness of each electrode layer (μm)	Catalyst amount (mg/cm^2)	Maximum output density (mW/cm^2)
Example 1	Positive electrode layer alone: 30 Positive electrode laminate: 65 Negative electrode layer alone: 35 Negative electrode laminate: 75	2	18.0
Example 3	Positive electrode layer alone: 30 Positive electrode laminate: 65 Negative electrode layer alone: 35 Negative electrode laminate: 75	2	17.0
Comparative Example 2	Positive electrode layer alone: 65 Negative electrode layer alone: 75	2	12.0

The data shows that the fuel cells of Examples 1 and 3 produced by using an electric power generating element for a fuel cell having the laminate with the inventive structure have a considerably improved maximum output density compared with a fuel cell of Comparative Example 2 having the same electrode layer thickness and the same amount of catalyst as the fuel cells of Examples 1 and 3 and having no adhesive layer. Therefore, it is respectfully submitted that the structures recited in claims 1, 7, 10 and 16 of the present application provide advantages not seen in the cited references.

As the MPEP directs, all the claim limitations must be taught or suggested by the prior art to establish a *prima facie* case of obviousness. See MPEP § 2143.03. In view of the fact that neither Motomura et al. nor Mizuno teach or fairly suggest: (i) providing the adhesive layer between the catalyst layers that are laminated; or (ii) making the polymer material having the proton conducting

property present more in the interface part of each of the catalyst layers that are laminated than in the inner part thereof, a *prima facie* case of obviousness cannot be said to exist.

[II-C] Comments on the Examiner's description of the prior art:

Applicants now use Fig. 1 of the present application as a nonlimiting embodiment to try to explain the Examiner's comments in page 3 of the outstanding Office Action.

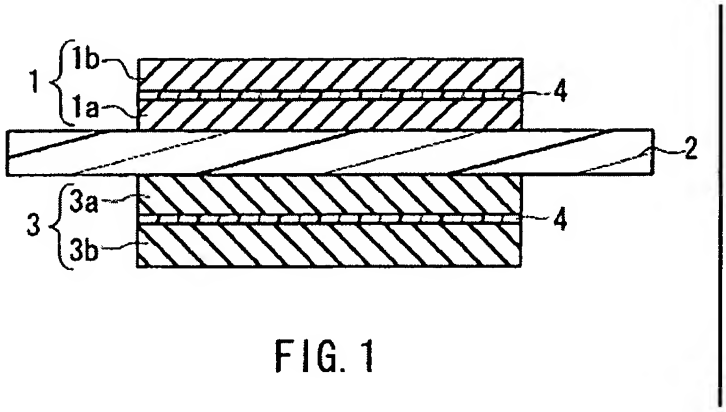

FIG. 1

The Examiner relies upon Mizuno for teaching that an adhesive layer 4 is laminated between separate electrodes 1a and 1b to form a positive electrode 1 (or separate electrodes 3a and 3b to form a negative electrode 3). Specifically, the Examiner states:

> The Mizuno reference teaches a Nafion solution of proton conducting solid polymer that functions as an adhesive to bond the layers of the fuel cell together (See paragraph [0048]). In addition, the adhesive is also similar to the ion exchange resin that is in the catalyst layer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Motomura fuel cell to include a proton conducting polymer adhesive layer in between the two catalyst layers in order to securely bond the catalyst layers together during the course of hardening.

Applicants respectfully disagree. Applicants have carefully reviewed Mizuno and can find no teaching or suggestion to laminate at least two electrodes with the Nafion to form a positive electrode or to form a negative electrode. Applicants note that Mizuno teach the use of a carbon cloth in the positive electrode, see 0047 of Mizuno. However, this is not an adhesive layer combining at least two separate electrode layers, as presently claimed.

Also, Applicants note that there is an electrolyte film (Nafion) 21 laminated between the anode 21 and the cathode 23, but there is no teaching or suggestion to prepare a structure as disclosed in Fig. 1 (above) wherein at least two electrodes are laminated to one another with an adhesive layer therebetween to form a positive electrode or to form a negative electrode, as presently claimed. Applicants respectfully request that the Examiner specifies where Mizuno teaches the use of an adhesive layer binding at least two electrodes to form a positive electrode or to form a negative electrode, as presently claimed.

Furthermore, the Examiner relies on Mizuno for teaching the inventive feature of making the polymer material having the proton conducting property present more in the interface part of each of the electrode layers than in the inner part thereof. On this matter, the Examiner states:

> As a result of laminating the catalyst layers with the polymer adhesive, the polymer adhesive would be present more in an interface part of each of the electrode layers than in an inner part.

Thus, it appears that the Examiner is taking the position that this feature is inherently present in the fuel cell of Mizuno. It is noted that MPEP 2112(III) sanctions the use of an obviousness rejection which relies on an inherent feature of the prior art. However, MPEP 2112(IV) makes it perfectly clear that whether the rejection is based on 35 USC 102 or 103, the inherent feature *must* be present in the apparatus for the rejection to be tenable. The inherency *must* flow as a necessary conclusion from the prior art, and not simply be a possible one. Applicants respectfully submit that Mizuno do not teach or suggest a polymer material having a proton conducting property binding at least two electrodes to form a positive electrode or to form a negative electrode, and as such, Mizuno could not inherently teach that said polymer material is present more in the interface part of each of the electrode layers than in the inner part thereof, as presently claimed.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Garth M. Dahlen, Ph.D., Esq. (Reg. No. 43,575) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

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Respectfully submitted,

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